

Appl. No. 09/914,404
Att. Docket No. 10191/1993
Reply To Final Office Action of 5/02/03

REMARKS

Claims 20, 23, 24, 26, 37 and 38 are canceled, without prejudice, and therefore claims 13, 16 to 18, 21, 22, 25, 27, 28, 30 to 36, 39 and 40 are currently pending.

Applicants respectfully request reconsideration of the present application in view of this Amendment.

As generally regards the Office Action, it is respectfully submitted that the prior responses have made clear that one skilled in the art would not have combined the references at the time of the claimed subject matter, and that even if they were combined as indicated in the Office Action the *combinations* of references relied upon do not disclose or suggest all of the features of the claimed subject matter.

In this regard the Office Action's combination of numerous references to present a patentability case as to the claimed subject matter amounts to an improper hindsight reconstruction in which parts of various references have been selectively picked and then combined, indicating that the disclosures of the references were not viewed in their entirety, as they would be by the skilled practitioner without the benefit of the present disclosure. The Court of Appeals for the Federal Circuit has inveighed against this procedure, and mandates that the teachings of a reference must be viewed in their entirety, and portions arguing against and "teaching away" from the claimed subject matter must be considered. (See Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 919 F.2d 720 (Fed. Cir. 1986)(emphasis added). In this context, a reference may be said to "teach away" from the claimed subject matter when a person having ordinary skill in the art is discouraged from following the direction set out in the reference or is led in a different direction from the one taken by the applicant. (See In re Gurley, 27 F.3d 551 (Fed. Cir. 1994)).

Claims 13, 16 to 18, 21, 22, 25, 28 and 30 were rejected under 35 U.S.C. §103(a) as unpatentable over the combination of Rosnowski, U.S. Patent No. 4,099,997 and Schwalke, U.S. Patent No. 5,496,765 and further in view of Weijland, U.S. Patent No. 3,907,615.

While the rejections may not be agreed with, to facilitate matters, claim 13 now includes the features of dependent claims 20 and 26 (which have been canceled, without

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prejudice), so that it provides a method for producing a semiconductor component in which a solid glass layer is applied on both the front and back sides of a semiconductor wafer, each side having opposite doping types, and a neutral glass layer is applied on the solid glass layers prior to heating the semiconductor wafer.

Since the Rosnowski, Schwalke or Weijland references, whether taken alone or combined, do not disclose these features of claim 13 as presented, it is submitted that claim 13 as presented, and its dependent claims 16 to 18, 21, 22, 25, 28 and 30 are allowable over the references relied upon.

Claims 20, 23, 24, 31 and 32 were rejected under 35 U.S.C. §103(a) as unpatentable over Rosnowski, Schwalke, and Weijland in further view of Evans, Jr. et al. U.S. Patent No. 4,104,091 (Evans).

While the rejections may not be agreed with, to facilitate matters, claims 20, 23 and 24 have been canceled, without prejudice, and claim 31 has been rewritten like claim 13 to include the feature of applying a neutral glass layer on the solid glass layers prior to heating the semiconductor wafer. Claim 32 depends from claim 31. It is submitted that even if Rosnowski, Schwalke, Weijland and Evans are combined, they do not disclose each of the features of claims 31 or 32, which are therefore allowable over the references relied upon for essentially the same reasons as claim 13.

Claims 26 and 27 were rejected under 35 U.S.C. §103(a) as unpatentable over Rosnowski, Schwalke, Weijland and further view of Shinohara (JP 59-80928).

While the rejections may not be agreed with, to facilitate matters, claim 26 has been canceled without prejudice. Claim 27 depends from claim 13 as presented. It is therefore submitted that even if Rosnowski, Schwalke, Weijland and Shinohara are combined, they do not disclose a method for producing a semiconductor component in which a solid glass layer is applied on both the front and back sides of a semiconductor wafer, each side having opposite doping types, and a neutral glass layer is applied on the solid glass layers prior to heating the semiconductor wafer. It is therefore submitted that claim 27 is allowable over the references relied upon for the same reason as claim 13.

Claim 33 was rejected under 35 U.S.C. §103(a) as unpatentable over Rosnowski, Schwalke, Weijland and Evans in further view of Tanigawa, U.S. Patent No. 6,020,644.

Claim 33 depends from and includes the features of claim 31. As the Tanigawa

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reference does not cure the deficiencies of the Rosnowski, Schwalke, Weijland and Evans references with respect to claim 31 as presented, it is submitted that claim 33 is allowable over the references relied upon for the same reasons as claim 31, as explained above.

Claim 34 to 37 and 40 were rejected under 35 U.S.C. §103(a) as unpatentable over Rosnowski, Schwalke, Weijland and Evans in further view of Sun, U.S. Patent No. 5,834,346.

Claims 34 to 37 and 40 depend from claim 31. As the Sun reference does not cure the deficiencies of the Rosnowski, Schwalke, Weijland and Evans references with respect to claim 31 as presented, it is submitted that claims 34 to 37 and 40 are allowable over the references relied upon for the same reasons as claim 31, as explained above.

Claims 38 and 39 were rejected under 35 U.S.C. §103(a) as unpatentable over Rosnowski, Schwalke, Weijland, Evans and Sun in further view of Shinohara.

As regards these rejections in particular (as well as the rejections generally), in the Office Action, the Evans reference (U.S. Patent No. 4,104,091 to Evans, Jr. et al.) is relied upon as purportedly disclosing the feature of applying a different dopant to glass layers on opposite sides of a semiconductor wafer, and the Shinohara reference (JP 59-80928) is relied upon as purportedly disclosing the feature of applying a neutral glass layer on a substrate prior to heating a substrate and removing the neutral glass layer after heating. As the following discussion explains, a skilled practitioner, without the benefit of hindsight, would not be motivated to combine the Evans and Shinohara references as suggested.

According to the claimed subject matter, the doping of the glass layers occurs through gaseous deposition techniques. That is, each wafer is exposed in a gaseous atmosphere to a particular type of dopant at a time. (See Specification, pages 2 and 3). In the case where a semiconductor wafer is doped with different-type dopants on opposite sides, once the first dopant has been deposited, a neutral glass layer then protects the doped glass from being exposed to the second dopant in the gaseous atmosphere during the second deposition stage. (See Specification page 2, lines 6 to 10). Thus, the neutral glass layer protects an underlying glass layer doped with a first dopant from exposure to a gaseous atmosphere containing a second dopant.

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The Evans reference purportedly concerns a method for applying diffusants in which dopants are incorporated into viscous pastes and then screen printed onto a semiconductor substrate. (See Evans, col. 3, line 29 to col. 4, line 5). Since Evans diffuses dopants into a glass from a semi-solid paste, and does not employ gaseous vapor deposition techniques, the problem of dopant contamination – exposure of one of more of the glass layers to an inappropriate type of dopant– would not be expected to occur since each glass layer would only be exposed to the particular paste applied to its surface and would not be exposed to a surrounding gaseous atmosphere containing other types of dopants. Thus, even if Evans were used to apply different dopants to opposite sides of a semiconductor substrate, there would be no need to apply a neutral glass layer over them to protect them from contamination from dopants in a gaseous atmosphere. The Shinohara reference further distances itself from the purported teachings of the Evans reference in that it plainly applies specifically to gaseous deposition techniques. (See Shinohara, Abstract) (stating the purpose “to prevent a flying-out of an impurity from a substrate *and an intrusion of an unnecessary impurity into the substrate from an atmosphere*”) (emphasis added).

Thus, the assertion that the Evans reference can be relied upon as teaching the feature of different doping on opposite sides of a substrate and then combined with the teaching of application of a neutral glass layer according to Shinohara plainly ignores the complete context of both references, a full and fair reading of which indicates the mutual inconsistency of the two references and the inappropriateness of their combination. It is again emphasized that the Office Action’s extraction and piecing-together of portions of the Evans and Shinohara references without regard to their complete contexts and entire disclosures is a prime example of the hindsight reconstruction that the case law has rejected.

It is therefore submitted that the Office Action has not established prima facie obviousness as to claims 38 and 39. It is therefore respectfully submitted that claims 38 and 39 are allowable.

In summary, it is respectfully submitted that claims 13, 16 to 18, 21, 22, 25, 27, 28, 30 to 36, 39 and 40 are allowable.

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CONCLUSION

In view of all the above, it is believed that rejections of the claims have been obviated, and that claims 13, 16 to 18, 21, 22, 25, 27, 28, 30 to 36, 39 and 40 are allowable. It is therefore respectfully requested that the rejections be reconsidered and withdrawn, and that the present application issue as early as possible.

Respectfully submitted,
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